

## **Body image concerns and psychological wellbeing among injured combat veterans with scars and limb loss: A review of the literature**

Accepted for publication in Military Behavioral Health 10<sup>th</sup> June 2020.

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### **Abstract**

A narrative literature review aimed to determine the nature and prevalence of body image and psychosocial concerns and associated support needs among veterans with combat-related appearance-altering injuries. A systematic approach to a narrative review included searching published and grey literature between September 2018 and January 2019 and again in November 2019. Four hundred and twenty-seven papers were retrieved and judged against the eligibility criteria. Four papers were considered eligible and relevant and included in the review. Limited research investigating body image and psychosocial concerns among combat veterans with an altered appearance exists. The four papers indicate that combat injured veterans may experience body image distress and symptoms of depression, anxiety, and social anxiety. Military culture may enable resilience. Additional research is required to determine the scope and nature of the psychosocial impact of appearance-altering injuries among combat injured veterans. Further research should identify support gaps and inform the development of evidence-based interventions where needed.

**Key words:** Body image; military veterans; combat veterans; combat injury; burns; limb loss; scars; physical scarring; disfigurement; resilience.

### **Introduction**

The nature of military combat activities means many personnel receive injuries that result in a change to appearance, such as scarring and limb loss. Since 2001, 1,645 US military personnel sustained battle-injury major limb amputations, including the loss of one or more limbs, the loss of one or more partial limbs, or the loss of one or more full or partial hand or foot (Fischer, 2015). Between 2003 and 2019, 333 UK military personnel received traumatic or surgical amputations due to injuries sustained during deployment in Iraq and Afghanistan (Ministry of Defence, 2019). Between March 2005 and March 2019, 10,100 UK military service and ex-

service personnel were in receipt of Armed Forces Compensation due to ‘injury, wounds and scarring’ sustained during military service. However, it is not clear how many of the compensation injuries led to a change to appearance. Moreover, it is possible that these statistics do not include service members with relatively smaller changes to their appearance or whose appearance was affected but without significant impact on physical function. Although the exact prevalence of UK and US military service and ex-service personnel with appearance-altering combat injuries is not available, what evidence there is indicates there are likely a substantial number. With advances in military medicine, many military personnel have survived injuries that would have previously been fatal (Tanielian & Jaycox, 2008), but could have resulted in a change to appearance. Despite the increase in potentially appearance-altering injuries, the psychological impact of these visible injuries is rarely evaluated. To date, research investigating such injuries has focused on immediate and long-term medical care, rehabilitation, and psychological trauma. Investigation of the psychosocial impact of a changed appearance and any associated support needs among injured combat veterans is needed.

Research conducted with civilians indicates that living with an appearance that is different from ‘the norm’, such as amputations and scars, can present significant psychological and social challenges. These include a negative impact on body image, self-esteem, and confidence (Clarke, Thompson, Jenkinson, Rumsey, & Newell, 2013; Lawrence, Fauerbach, & Thombs, 2006; Rumsey & Harcourt, 2012) and feelings of anger and hostility (Blakeney, Rosenberg, Rosenberg, & Faber, 2008). Many civilians with an altered appearance report difficulties managing the stigmatising reactions and behaviours of others such as staring, inappropriate comments, avoidance and unsolicited questions (Martin, Byrnes, McGarry, Rea, & Wood, 2017; Rumsey & Harcourt, 2012). Concerns about the impact of appearance on the ability to establish and maintain intimate relationships have been reported by individuals who have sustained scars from burns or lost limbs (Geertzen, Van Es, & Dijkstra, 2009; Mathias & Harcourt, 2014; Sharratt, Jenkinson, Moss, Clarke, & Rumsey, 2018). These appearance-related concerns and their psychological impact, can lead to social avoidance and isolation for some, which is often associated with the distressing belief that they are being judged negatively because of how they look (Holzer et al., 2014; Levine, Degutis, Pruzinsky, Shin, & Persing, 2005). Of note, not

everyone who experiences a change to appearance because of an injury is negatively affected. Many people manage well, could be thriving, and could have experienced personal growth. The likelihood of and extent to which individuals experience challenges associated with appearance is most likely influenced by individual psychosocial factors, rather than the type, location or extent of the altered appearance (Clarke et al., 2013).

Cultural factors are likely to influence how individuals who have sustained appearance-altering injuries make sense of their experience and adjust to looking different (Clarke et al., 2013).

Demographics of particular groups such as age, gender, race, and peer influences are also likely to play a role. Appearance is often perceived differently in different cultures and among different demographic groups, such that for example, there might be a particular premium placed on appearance for women, or a particular ideal placed on how males should look (Clarke et al., 2013).

The military has its own culture characterised by masculine ideals and beliefs about physical and sexual prowess and an ethos of hardiness (Christian, Stivers, & Sammons, 2009; Hockey, 1986; Mankayi, 2008). This could lead those who have sustained a combat injury that has resulted in a change to their physical appearance to re-evaluate their sense of masculinity, which in turn could affect self-esteem, psychological wellbeing, and sexual and other relationships. However, evidence to support this deduction or any literature providing insights into how military service and ex-service personnel adjust to an altered appearance and to looking different following combat injuries appears limited.

Despite an established evidence base for the psychosocial impact of a visibly different appearance among civilians and the sizeable numbers of personnel sustaining appearance-altering injuries during military operations, there seems to be a dearth of research investigating the psychosocial impact of appearance-altering injuries among military service and ex-service personnel. Based on the nuanced nature of military culture, it would be naïve to assume that evidence taken from civilians would be directly translatable to military populations.

Although research with civilian populations indicates considerable similarity in the challenges facing people with an unusual appearance regardless of its cause or type (Rumsey & Harcourt,

2012), research with those who have sustained a burn injury indicates trauma symptoms are positively associated with appearance concerns (Shepherd, 2015). This highlights the importance of paying particular attention to appearance-related issues when supporting those whose appearance has been affected due to traumatic injuries.

Due to the differing cultural context of the military and the high probability that injuries are sustained under traumatic conditions, there is a clear need to understand what is known about the appearance-related concerns, psychological wellbeing, and support needs of military service and ex-service personnel affected by combat-related appearance-altering injuries. Such knowledge is necessary to determine if specific appearance-related support is needed and if so to inform the development and provision of appropriate and effective psychological interventions and support materials.

***Aim:***

There appear to have not been any previous efforts to systematically search for and review existing literature focused on the psychosocial impact of having an altered appearance as a result a of combat-related injury among military service and ex-service personnel. Since there appears to be limited existing literature this review aimed to address four broad questions:

1. What is the nature and prevalence of body image concerns and their intersection with psychosocial health concerns, among military service and ex-service personnel with combat-related appearance-altering injuries?
2. What, if any, are the support needs of military service and ex-service personnel, with combat-related appearance-altering injuries?
3. Are there modifiable psychological and social challenges that can be targeted in interventions to improve body image, promote body acceptance, and improve psychological health among this group?
4. What if any, are the future directions and recommendations for development of interventions for military service and ex-service personnel with combat-related appearance-altering injuries?

## **Method**

A systematic approach to a narrative review of the literature was taken to address the four questions. An initial broad search indicated there would be limited literature and so a traditional systematic review was deemed unnecessary. The systematic approach to a narrative review of the literature included searching published and grey literature.

### ***Information sources and search***

Published papers were searched for using a systematic approach in BioMed Central, Cochrane Library, Google Scholar, Ovid, PubMed, PsycINFO, SAGE Journals, Science Direct, SpringerLink, Taylor & Francis, Web of Science, and Wiley Online. The search was conducted using the keywords 'Injuries', 'Military', 'Impact', 'Appearance-altering' 'Support' (Table 1).

### **TABLE 1 HERE**

The search was run between September 2018 and January 2019 and re-run in November 2019. Table 2. provides details of the combinations of search terms used. Reference lists of eligible papers were hand searched and forward citation tracking of included articles was conducted using Google Scholar. Grey literature was sought through Google searches of relevant government and policy documents, and by contacting key experts in the military and appearance research fields.

### **TABLE 2 HERE**

### ***Eligibility criteria***

Papers were eligible for inclusion if they were peer-reviewed and published in English. Due to the expected small numbers of papers, case reports, conference proceedings, editorials, literature reviews, qualitative and quantitative studies were included. Studies with samples of currently serving and ex-service regular or reserve personnel, and their families, who sustained appearance-altering, combat-related injuries any time since 1969 (the start of conflicts in Northern Ireland) to present day were included. Studies including samples of military service and ex-service personnel from any country were eligible as long as the paper was written in

English. Studies which did not identify injuries as being appearance-altering and combat-related were excluded from the review.

### ***Screening strategy***

Study titles and abstracts were screened and included for a full-article review if they initially appeared to meet the eligibility criteria but had information missing. All records were managed using Mendeley® v1.17.13 software. All included papers were considered in terms of quality, such as design and sample size, however studies were not excluded for these reasons.

## **Results**

### ***Overview of papers***

A total of 427 papers were retrieved from the search of the databases and contact with key stakeholders. The grey literature search and contact with key experts did not identify any additional papers. As shown in figure 1, from study title and abstract screening, 10 papers were read in full and judged against the eligibility criteria. Four articles were deemed eligible and were included in this review. Of the four papers, three reported research carried out in the US, and one reported research conducted in Turkey. All of the papers focused on military populations including reserve and regular forces. One paper (Cater, 2012) included only women, two (Akyol et al., 2013; Messinger, 2009) included only men, and one (Weaver, Walter, Chard, & Bosch, 2014) included both men and women, with a male majority. One paper included participants with lower limb amputation only (Akyol et al., 2013), one included participants with both upper and lower limb amputation (Cater, 2012), one included participants with upper limb amputation only (Messinger, 2009), and one involved participants with a range of ‘appearance-related residual injuries’ including scars, marks, and functional impairments such as paralysis (Weaver et al., 2014). The papers were published between 2009 and 2014 but included service and ex-service personnel from combat eras including Vietnam (US involvement 1965 – 1975) through to the recent conflicts in Iraq (2003) and Afghanistan (2001). Two of the papers did not state the years of data collection, one of the papers collected data between January and March 2010 (Akyol et al., 2013), and another included participants who had been part of larger study that was conducted between 2006 and 2008 (Messinger,

2009). Two of the studies used cross-sectional quantitative designs and two used qualitative designs. The sample sizes of the qualitative studies ranged from  $n = 2$  to  $n = 6$  and the sample sizes of the quantitative studies ranged from  $n = 60$  to  $n = 91$  (Table 3).

**FIGURE 1 HERE**

**TABLE 3 HERE**

The papers were reviewed (by two of the authors, anonymized for review), in consideration of the four research questions drawing out evidence from the papers that addressed each of the questions. The results from this narrative review are presented in response to each question.

***What is the nature and prevalence of psychosocial and body image concerns among military service and ex-service personnel with combat-related appearance-altering injuries?***

Clear prevalence rates of psychosocial and body image concerns were not available in any of the four papers. The closest indication of prevalence was reported by Akyol, Tander, Goktepe, Sfaz, Kuru & Tan (2013) who found that compared to healthy controls, those with lower limb amputations had significantly higher scores on the Beck Depression Inventory and the Beck Anxiety Inventory; a direct association between symptoms of depression, symptoms of anxiety and appearance concerns was not however reported.

The four papers provide some evidence of the nature of psychosocial and body image concerns. The two qualitative papers consistently found evidence for increased self-consciousness related to appearance among their samples of six female (Cater, 2012) and two male (Messinger, 2009) amputees. Adjusting the internal image of how they look to match the reality of their bodies post injury, was reported as challenging for one of the two male veterans in Messinger's (2009) case study and for some of the female veterans in Cater's (2012) phenomenological study.

Both Messinger (2009) and Cater (2012) report evidence that appearance-related concerns affect social relationships. One of the veterans in Messinger's (2009) study reported social avoidance and isolation due to body image concerns. Among the female veterans in Cater's (2012) research was a concern that their friends may no longer want to associate with them and many were concerned about public stigma, especially among those with an upper limb

amputation. Messinger (2009) reports that the two veterans in his study experienced anger and problems sleeping. However, it is unclear if these were related to appearance and body distress.

Of note, in Messinger's (2009) study, while evidence of appearance-related concerns were evident in each of the two veterans' cases, these are not included in the discussion of the results. Thus, while appearance concerns were evident, they were not a focal point of the paper. This is interesting since the conclusion of this paper draws on the fact that the amputee rehabilitation program's primary focus on physical rehabilitation misses the important role of psychosocial issues in recovery.

The two quantitative papers provide consistent evidence for a positive association between body image distress and symptoms of depression (Akyol et al., 2013; Weaver et al., 2014). An association between increased body image distress and Post Traumatic Stress Disorder (PTSD) was not found (Weaver et al., 2014). Weaver et al. (2014) reported that 75% of their sample met diagnostic criteria for PTSD however, 59% of the index trauma was combat injury-related which could partially explain the lack of association between body image distress and PTSD. Akyol et al. (2013) found that those with a lower limb amputation reported lower quality of life compared to healthy controls and that increased body image distress was associated with lower quality of life.

The four studies provide evidence that body image distress is associated with symptoms of depression, as measured using the Beck Depression Inventory, among military personnel and veterans with combat-related appearance-altering injuries. Additional difficulties include reduced quality of life, anger, sleep problems, potential relationship difficulties, social avoidance and isolation, perceived stigma, and adjusting their internal representation of their self and body image.

***What are the support needs of military service and ex-service personnel with combat-related appearance-altering injuries?***

None of the papers directly reference or provide evidence of any support needs of military service and ex-service personnel with appearance-altering combat injuries. While none of the



reviewed papers made specific recommendations about psychosocial support, deduction from the findings of those papers as stated above, indicates that support may be beneficial for those struggling with body image distress, reporting symptoms of depression, anxiety, and social anxiety, as well as for managing perceived stigma, and relationship challenges.

Messinger (2009) concludes that a range of psychosocial issues need to be considered during rehabilitation, although the nature of those issues are not specified and this conclusion is not specifically related to appearance-related concerns. In Cater's (2012) study, many of the female veterans believed that only another veteran amputee could understand their life experience. This may have implications for the provision of services delivered by health professionals lacking military experience.

***Are there modifiable psychological and social challenges that can be targeted in interventions to improve body image, promote body acceptance, and improve psychological health among this group?***

Symptoms of depression, as measured using the Beck Depression Inventory, among veterans with appearance-altering injuries were reported in the two quantitative studies. Moreover, in both studies, reported symptoms of depression were associated with body image distress. Therefore, interventions targeting the reduction of body image distress could be effective in reducing reported symptoms of depression. Investigation of what might influence body image distress was not included in either of the quantitative studies, thus not providing evidence of what could usefully be targeted in interventions. The two qualitative studies however, do highlight some specific experiences and challenges that might be associated with body image distress and that could be targeted in interventions.

As described above, Cater's (2012) and Messinger's (2009) studies report that adjusting their internal representation of their body and their appearance following an injury can be challenging for some veterans. An intervention targeting this process could be beneficial to support injured veterans in the process of accepting their post-injury appearance. The female veterans in Cater's (2012) study reported that while the adjustment of their own internal self-image was difficult, they expressed greater concern about how other people viewed them. A

similar experience was reported in Messinger's (2009) case studies of two male veterans. Thus, interventions aimed at managing perceived stigma and interactions with others could be useful.

Cater's (2012) study raised the important role of military culture in recovery. Specifically, how the ethos of hardiness and presence of role models who had been through similar experiences enabled resilience and perseverance when recovery was challenging. Drawing on their personal courage helped the female veterans when meeting strangers, meaning they did not avoid social situations but instead drew on the resilience they had grown to manage their diminished self-confidence. Cater (2012) also reports that many of the female veterans were proud to be seen with their prosthetics limbs and in some ways considered them a badge of honour representing their service to their country.

Having good social support, a positive outlook, and positively reframing the experience of their injury, enabled the female veterans in Cater's (2012) study to manage some of the appearance-related challenges they faced. Interventions that facilitate social support and enable positive reframing of their injury and its impact could help minimise appearance-related psychological distress.

Weaver et al. (2014) did not directly investigate any factors that might be associated with body image distress and/or reported symptoms of depression. However, they do allude to the veterans having 'distressing cognitions' that may impact their body image and psychological wellbeing. They highlight masculinity as a particular factor that could affect body image alongside identity more broadly and in the context of military culture. They also propose that scars could function as a reminder of the injury that may also affect body image distress. Weaver et al. (2014) highlight these as important factors that could form the content of psychological interventions and that should be investigated in future research.

Three papers indicated that the nature of the injuries should be considered when planning interventions, especially function and physical recovery. Cater (2012), Messinger (2009) and Akyol et al. (2013) report that prosthetic use and physical function are closely connected to psychosocial wellbeing and appearance concerns. Akyol et al. (2013) also highlight the impact of pain in overall recovery and wellbeing, but not specific to appearance.

***What if any, are the future directions and recommendations for development of interventions for military service and ex-service personnel with combat-related appearance-altering injuries??***

Based on Cater (2012) and Weaver et al. (2014), military context and culture should be considered in future research and in the development of interventions to support members of the Armed Forces community affected by appearance-altering injuries. The findings that female veterans would prefer support to be provided by those with a lived experience and that recovery in the military culture enhances resilience (Cater, 2012) have implications for how and by who interventions should be delivered. As stated above, Weaver et al. (2014) make recommendations for future research to investigate cognitions about self and identity unique to the military, especially masculine identities, since these may be important factors associated with body image distress. Weaver et al (2014) recommend future investigations to understand the impact on body image of scars that act as a reminder of the injury.

Messinger (2009) highlights the importance of considering the broader context of the injury in future research and interventions, mostly in terms of the control individuals felt over the conditions under which they were injured and their later treatment. As stated earlier, Messinger (2009) also highlights the focus on physical functioning in current recovery programs and a need to include a range of psychosocial issues, but does not specify these. Akyol et al.'s (2013) main recommendation is that the rehabilitation of amputee veterans should focus on reducing symptoms of depression and anxiety, managing pain, improving body image and increasing locomotor activities; however, they do not suggest how this could be achieved.

**Discussion**

A review of the literature was conducted to establish what is currently understood about the psychosocial impact of appearance-altering combat injuries among military service and ex-service personnel. The review identified four eligible and relevant papers. Overall, the review indicates that combat veterans' experiences of a change to their appearance following combat injuries and the psychosocial impact this might have, is relatively unexplored. This is consistent

with limited research about appearance-altering conditions and injuries found in other populations (Jenkinson, Williamson, Byron-Daniel, & Moss, 2015).

The prevalence of psychosocial and body image concerns was unclear from the reviewed papers. Two papers provided evidence that combat veterans with appearance-altering injuries experienced symptoms of depression and body image distress and that the two are associated (Akyol et al., 2013; Weaver et al., 2014). The reviewed papers also provided evidence for other psychosocial and appearance-related distress experienced by combat injured veterans with a changed appearance that are consistent with those reported in the civilian literature. Increased self-consciousness, social avoidance and isolation, concerns about what others think and managing stigmatized reactions, anger, problems sleeping and problems with relationships, have been reported among individuals who have sustained scars from burns or lost limbs in the general population (Geertzen, Van Es, & Dijkstra, 2009; Holzer et al., 2014; Mathias & Harcourt, 2014; Rumsey & Harcourt, 2012; Sharratt, Jenkinson, Moss, Clarke, & Rumsey, 2018; Blakeney, Rosenberg, Rosenberg, & Faber, 2008; Clarke, Thompson, Jenkinson, Rumsey, & Newell, 2013).

This review did not identify research specific to the support needs or interventions that might benefit combat injured veterans with appearance concerns. It does indicate that combat injured veterans whose appearance has changed due to their injury, may need support with body image distress and possible associated symptoms of depression. In the civilian literature and clinical practice, CBT (Cognitive Behavioural Therapy)-based techniques inform much of the support offered by clinical psychologists and other psychosocial specialists to support individuals affected by an altered appearance (visible difference) (e.g. Clarke et al., 2013).

Alternative approaches, such as interventions based on Acceptance and Commitment Therapy (ACT), are also being developed and tested for use with the general population with a visibly different appearance (Zucchelli, Donnelly, Williamson, & Hooper, 2018). However, as the reviewed papers indicate cultural nuances within the military, interventions designed for the civilian population may not be appropriate for use with combat injured veterans; determining this requires specific research.

The reviewed qualitative papers indicate that combat injured veterans may also experience difficulties such as social anxiety, stigma, difficulty adjusting their internal representation of how they look, and frustration, problems sleeping and relationship difficulties. In the general population, lower intensity and self-directed resources such as online interventions (e.g. <https://www.faceitonline.org.uk/>), peer support or psycho-education have been developed to assist individuals to manage these kinds of appearance-related challenges (Rumsey & Harcourt, 2012). Further research is needed to examine whether these resources, or adapted versions, might also benefit combat injured veterans.

Consideration of the military culture is important for the development of interventions and resources. Cater (2012) highlighted a preference for support from those with a lived experience, the potential benefit of military peer support, how aspects of military culture such as an ethos of hardiness and perceiving limb loss and prosthetics as badges of honor, can help to build resilience. Weaver et al (2014) highlights the need to consider the masculine context of the military, military-specific identities and the potential for scars to act as a reminder of the injury. These nuanced aspects of military culture could be harnessed in the development of support for combat injured veterans and should be considered by health care professionals working with combat injured veterans.

### ***Implications and future directions:***

This review highlights a need for further research to specifically examine the role of the military context and culture in adjustment to an altered appearance after a combat injury, and the development of interventions and support. The relationships between prosthetic use and pain and their relation to appearance concerns should also be investigated in military populations. Since the reviewed papers were predominately from the US, with one from Turkey, there is a specific need for research with UK combat injured service and ex-service personnel whose appearance was affected by their injuries. It is well documented in the literature that the experience of UK military personnel differs to the experiences of service personnel from other countries due to differences in ethos, training, deployment experiences, military medical services, and post-service medical services, for example access to Veterans Affairs services in

the US. Future research should aim to: determine the scope and nature of any appearance specific problems; explore what, if any, appearance specific interventions or support are currently available in the UK and elsewhere, including any that are not evidence-based and have not been evaluated; and, examine the use of existing civilian interventions and the development of new military specific interventions to support combat injured veterans experiencing appearance-related distress.

### ***Strengths and limitations:***

This is the first review aimed at understanding what is currently known about the psychosocial impact and support needs of combat injured military service and ex-service personnel with a change to their appearance due to their injury. This review adds to the literature highlighting an area of need for research to inform the development of tailored support and interventions for this specific group of combat veterans. There are however, limitations to this review such as the broad narrative approach rather than a more robust systematic review. However, based on the limited published research and the novelty of the topic, a narrative review was successful at identifying and synthesizing the existing knowledge in this relatively unexplored field.

The papers included in this review are from a predominantly US perspective and both the quantitative and qualitative studies had relatively small sample sizes. Therefore, the reviewed research is limited and not necessarily reflective of the experiences of combat injured veterans with an altered appearance per se. However, this also provides evidence and rationale for future research to understand the experiences of combat injured veterans with an altered appearance in the UK and other countries, using robust approaches.

### **Conclusion**

This review indicates that despite a substantial number of combat injured veterans whose injuries have resulted in a change to their appearance, there is limited research aimed at understanding the psychosocial impact of a changed appearance and the related support needs of these combat veterans. The four reviewed papers provide evidence that combat injured veterans with an altered appearance can experience psychosocial challenges consistent with those experienced by civilians with a visible difference. However, the reviewed papers

demonstrate military specific nuances suggesting there may be additional factors affecting injured combat veterans' psychosocial experience of their changed appearance. Therefore, the use of existing interventions and support materials for civilians may not be appropriate or effective for individuals whose appearance has changed as a result of a military combat injury. Research is needed to determine the scope and nature of the psychosocial impact of appearance-altering injuries among combat injured veterans and this should be used to inform the development and implementation of evidence-based interventions and support materials.

**Acknowledgements:** The authors wish to acknowledge the \*funder name removed for blind review\* for funding the \*study name blinded for review\* within which this literature review was conducted. \*Blinded for review\* is being conducted as part of the \*blinded for review\*.

**Declaration of Interest Statement:** There are no conflicts of interest to report for any of the authors.

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Table 1 Search terms included for each heading

<b>Injuries:</b>
Amputee, amputation, "limb loss", mangled, physical, wound*, injur*, impair*, burn, blast, health, disability, trauma*, polytrauma, casualty
<b>Military:</b>
Military, "Armed Forces", combat, "national guard", "Air Force", RAF, Army, Navy, Marine, regular, reserv*, soldier, "service personnel", troop, serving, veteran*, "ex-service personnel"
<b>Impact:</b>
Impact, difficulties, adversities, vulnerabilities, adjustment, adjusting, cope, coping, resilience, "social engagement", psycho*, "psychological functioning", depression, anxiety, stress*, PTSD, Burden, needs
<b>Appearance-altering:</b>
Appearance, "visible difference", deform*, disfigur*, scar*, "abnormal appearance", "impaired appearance", "body image", embodiment, "body functionality"
<b>Support:</b>
Support, help, relief, service*, "service provision", respite, therapy, intervention, counselling, finance, financial, grant, relocat*, housing, modification, adaptation, employment, "military transition", "military to civilian transition", transition, resettlement, "help seeking"

Table 2 Search term combinations

[Injuries] AND [Military] AND [Impact]
[Injuries] AND [Appearance-altering] AND [Military]
[Injuries] AND [Appearance-altering] AND [Military] AND [Impact]
[Injuries] AND [Appearance-altering] AND [Military] AND [Support]
[Injuries] AND [Appearance-altering] AND [Military] AND [Impact] AND [Support]

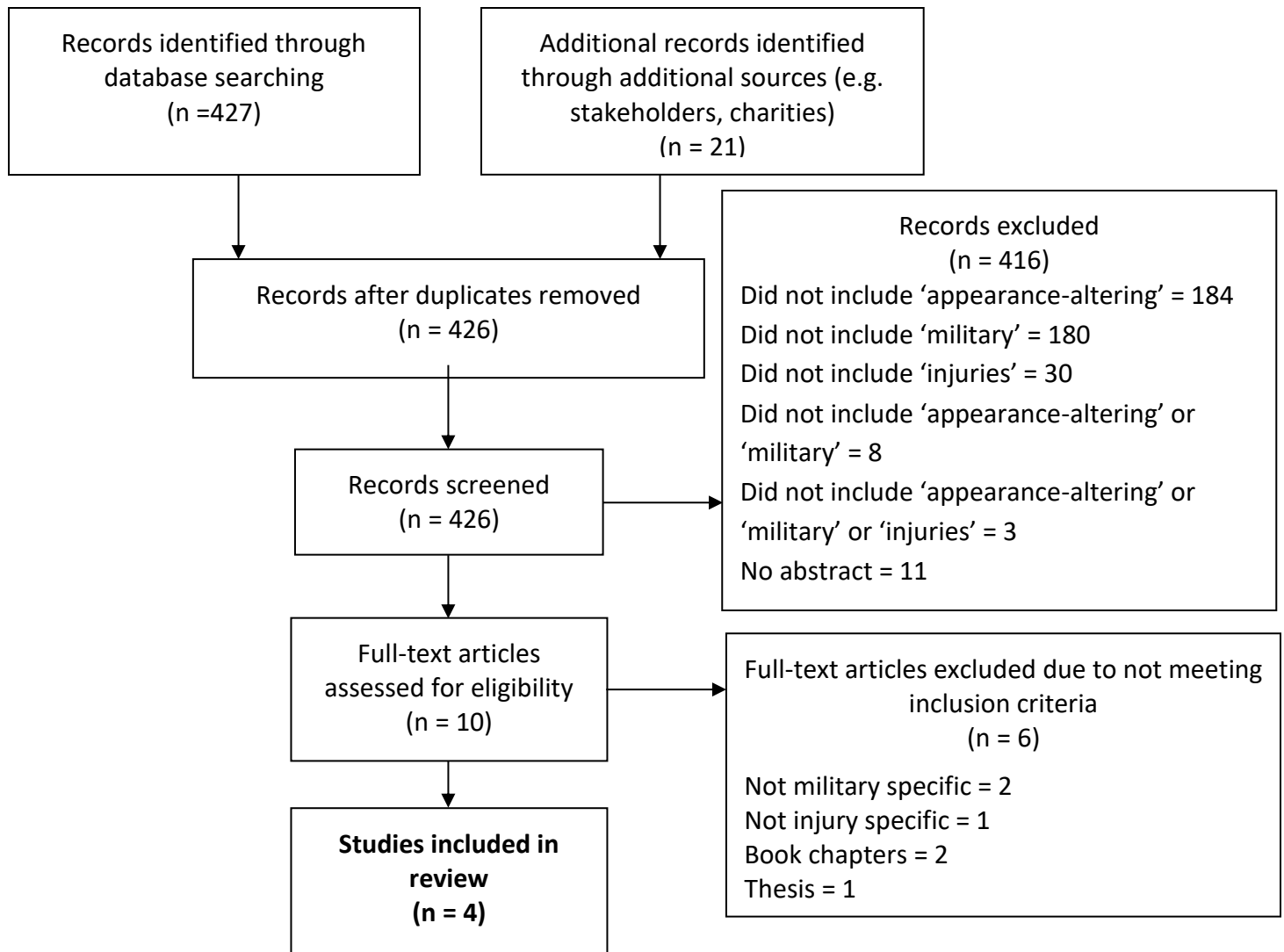


Figure 1 Screening process flow diagram

Table 3 Overview of included papers

Author(s)	Date	Title	Sample population and size	Study design	Main outcome/focus	Country
Akyol Tander, Goktepe, Safaz, Kuru & Tan	2013	Quality of life in patients with lower limb amputation: Does it affect post-amputation pain, functional status, emotional status, and perception of body image?	60 Military personnel: n = 30 with traumatic lower limb amputation undergoing rehabilitation in an inpatient amputee clinic at a military rehabilitation centre. n = 30 male health control	Cross-sectional survey	Quality of life, depression, anxiety and body image	Turkey
Cater	2012	Traumatic amputation: Psychosocial adjustment of six Army women to loss of one or more limbs	6 Army/Army National Guard women 5 women had lost one or more limb in combat 1 woman served a tour of duty in Iraq with a prosthetic leg	Qualitative Phenomenological	Psychological adjustment following traumatic amputation	USA
Messinger	2009	Incorporating the prosthetic: Traumatic limb-loss rehabilitation and refigured military bodies	2 patients from Amputee Patient Care Program at Walter Reed Army Medical Centre 1 Reservist 1 Active Duty Officer Both injured during combat deployments	Case Study Medical anthropological approach	Exploration of how patients with traumatic limb loss construct new post-injury bodies and social worlds focussing on their relationships with others.	USA

Weaver, Walter, Chard, & Bosch	2014	Residual Injury, Appearance-related concerns, symptoms of post-traumatic stress disorder, and depression within a treatment seeking veteran sample	91 veterans 83.5% male Service Era: Operation Enduring Freedom/Operation Iraqi Freedom (34%) Persian Gulf (20.9%) Post-Vietnam (18.7%) Vietnam (26.4%)	Cross-sectional Diagnostic and psychosocial interview Self-report questionnaires	Clinician Administered PTSD Scale for DSM-IV (CAPS) PTSD Checklist – Stressor-Specific Version (PCL-S) Beck Depression Inventory (BDI-II) Dysmorphic Concerns Questionnaire (DCQ) Health Assessment questionnaire (presence, number, nature of appearance- related residual combat injuries, if visible when clothed	USA
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